

Message

From: CN=Phil North/OU=R10/O=USEPA/C=US [CN=Phil North/OU=R10/O=USEPA/C=US]
Sent: 10/13/2011 6:40:21 PM
To: Daniel Schindler [deschind@uw.edu]
CC: andjr@uaa.alaska.edu;rsshaftel@uaa.alaska.edu;Thomas P Quinn [tquinn@u.washington.edu];
sshafte1@uaa.alaska.edu;Thomas P Quinn [tquinn@u.washington.edu]; Thomas P Quinn [tquinn@u.washington.edu]
Subject: Re: Salmon derived nutrients moving into Bristol Bay
Attachments: North.Phil@epamail.epa.gov; (907) 714-2483; north.phil@epa.gov

Daniel,

Thanks for the quick response. You are correct in the purpose of my question - the contribution of spawning salmon providing nutrients to near shore marine systems. The draft wildlife reports we have gotten emphasize the importance of Nushagak and Kvichak Bays for shorebirds and waterfowl. Since you are cited I imagine you are quite familiar with this. I was wondering if there was a link between the rich forage in the bays and spawning salmon. Evidently not.

Thanks
Phil

Phillip North
Environmental Protection Agency
Kenai River Center
514 Funny River Road
Soldotna, Alaska 99669
(907) 714-2483
fax 260-5992
north.phil@epa.gov

"To protect your rivers, protect your mountains."

From: Daniel Schindler <deschind@uw.edu>
To: Phil North/R10/USEPA/US@EPA
Cc: Thomas P Quinn <tquinn@u.washington.edu>, andjr@uaa.alaska.edu, rsshaftel@uaa.alaska.edu
Date: 10/12/2011 10:22 PM
Subject: Re: Salmon derived nutrients moving into Bristol Bay

Hi Phil,

I do not know of any full assessment of marine-derived nutrients flowing back from the rivers to Bristol Bay. Nutrients could move through two primary mechanisms: 1) smolts leaving rivers and carrying back some of their maternally-derived or ecosystem-derived nutrients, and 2) hydrologic flushing back to the ocean. I've attached a paper where we estimated #1 and not-surprisingly, it is not a very big number. For #2 you really need good hydrologic estimates to get believable numbers for the nutrient fluxes. That said, we do know that the lakes are strongly phosphorus limited and that most of the marine-derived P likely sediments out into the lakes of the region as the plankton there will strip it out of the water. Marine-derived N is more likely to be flushed out of the system but the reality is that these systems are awash in N so the marine-derived component of it is relatively small. Using stable isotopes of N I estimated that the freshwater ecosystems of Bristol Bay have about 30% marine-derived N in them (see section in Naiman et al. paper).

I have talked with various folks who have wondered whether salmon returns to rivers of BB could benefit marine systems as the marine-derived nutrients leak their way back out to the ocean. Not sure if this is where you are going with your question but I think that such a mechanism is very unlikely to be important to the nutrient budgets of the nearshore marine ecosystems.

I hope this is helpful.

Cheers,
Daniel

On Wed, Oct 12, 2011 at 5:53 PM, <North.Phil@epamail.epa.gov> wrote:

Tom and Dan,
Do you know if anyone has attempted to estimate the amount or portion of salmon derived nutrients that move out of the Nushagak (including Wood R) and Kvichak River systems into Bristol Bay? I suppose it does not have to be those rivers. I know there are estimates on the efficiency of salmon streams in retaining marine derived nutrients. I am not current with the literature. Can you offer of citation or two?

Phil

Phillip North
Environmental Protection Agency
Kenai River Center
514 Funny River Road
Soldotna, Alaska 99669
(907) 714-2483
fax 260-5992
north.phil@epa.gov

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[attachment "Naiman MDN review.pdf" deleted by Phil North/R10/USEPA/US] [attachment "Moore&Schind smolts.pdf" deleted by Phil North/R10/USEPA/US]